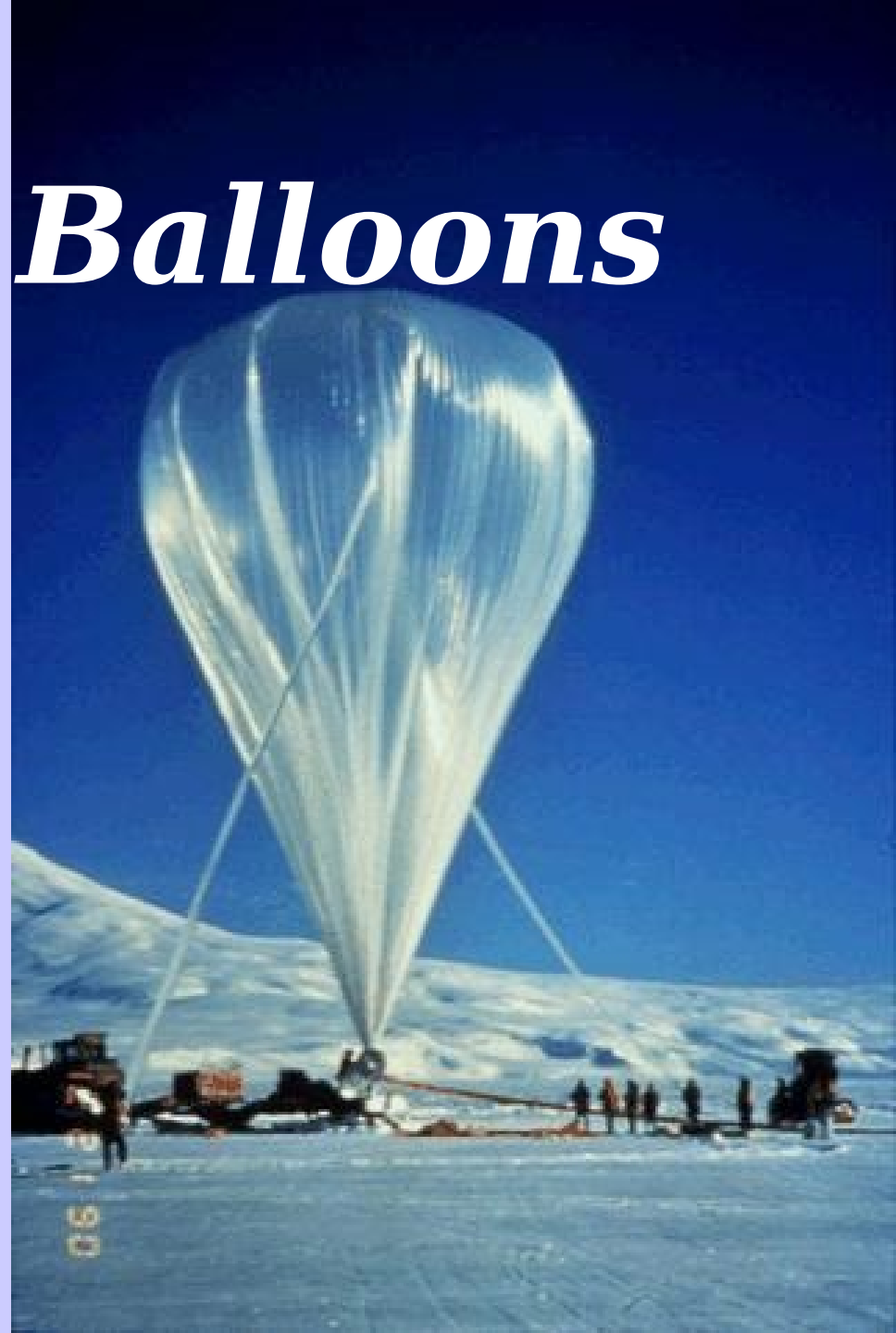


Upper Air Codes

NEMOC Training Department

Weather Balloons

- Weather balloons are launched at over 100 selected sites across the United States and thousands of sites across the world simultaneously two times every day.
- An instrument called a radiosonde is carried aloft by a hydrogen or helium filled balloon. Height, temperature, pressure, winds, and humidity of the balloon is continuously monitored. The data is transmitted back to computers on the ground.
- When the balloon bursts, the instrument floats earthward via a parachute.



Rocketsonde

- Taken by the National Aeronautical and Space Administration and the Department of Defense at various locations to get readings where balloons can not reach, between 100,000 and 200,000 feet.
- These rocketsondes are carried aloft by rockets and then dropped to measure the meteorological variables.
- Coding is different than that for balloon data and is not covered in this brief.



Mandatory Levels

- There are twelve levels at which data ***must*** be reported in each report, provided the radiosonde and balloon make it that far!

pressure level(mb)	approximate height(m, MSL)
-------------------------------	---------------------------------------

surface	0 (AGL)
---------	---------

1000	100
------	-----

925	800
-----	-----

850	1500
-----	------

700	3000
-----	------

500	5500
-----	------

400	7500
-----	------

300	9000
-----	------

250	10,500
-----	--------

200	12,000
-----	--------

150	14,000
-----	--------

100	16,000
-----	--------

trop	(variable)
------	------------



Mandatory Levels

- **TTAA** YYGGi_D IIiii 99P_oP_oP_o TTTDD dddff 00hhh TTTDD dddff 92hhh TTTDD dddff P_mP_mhhh TTTDD dddff ... 10hhh TTTDD dddff 88P_TP_TP_T TTTDD dddff 77P_vP_vP_v 4v_bv_bv_av_a 51515
 - **YY**: YY - 50 = day of month; >50 indicates winds in knots.
 - **GG**: 00 or 12Z
 - **IIiii**: Station Identifier
 - **99P_oP_oP_o** : Surface Pressure
 - **TTTDD**: Surface Temp and Dewpoint Depression
 - **dddff**: 10 meter winds (degrees and knots)
 - **00hhh**: 1000 mb height
 - **TTTDD**: 1000 mb Temp and Dewpoint Depression
 - **P_mP_m**: Next sequential mandatory level

Significant Levels

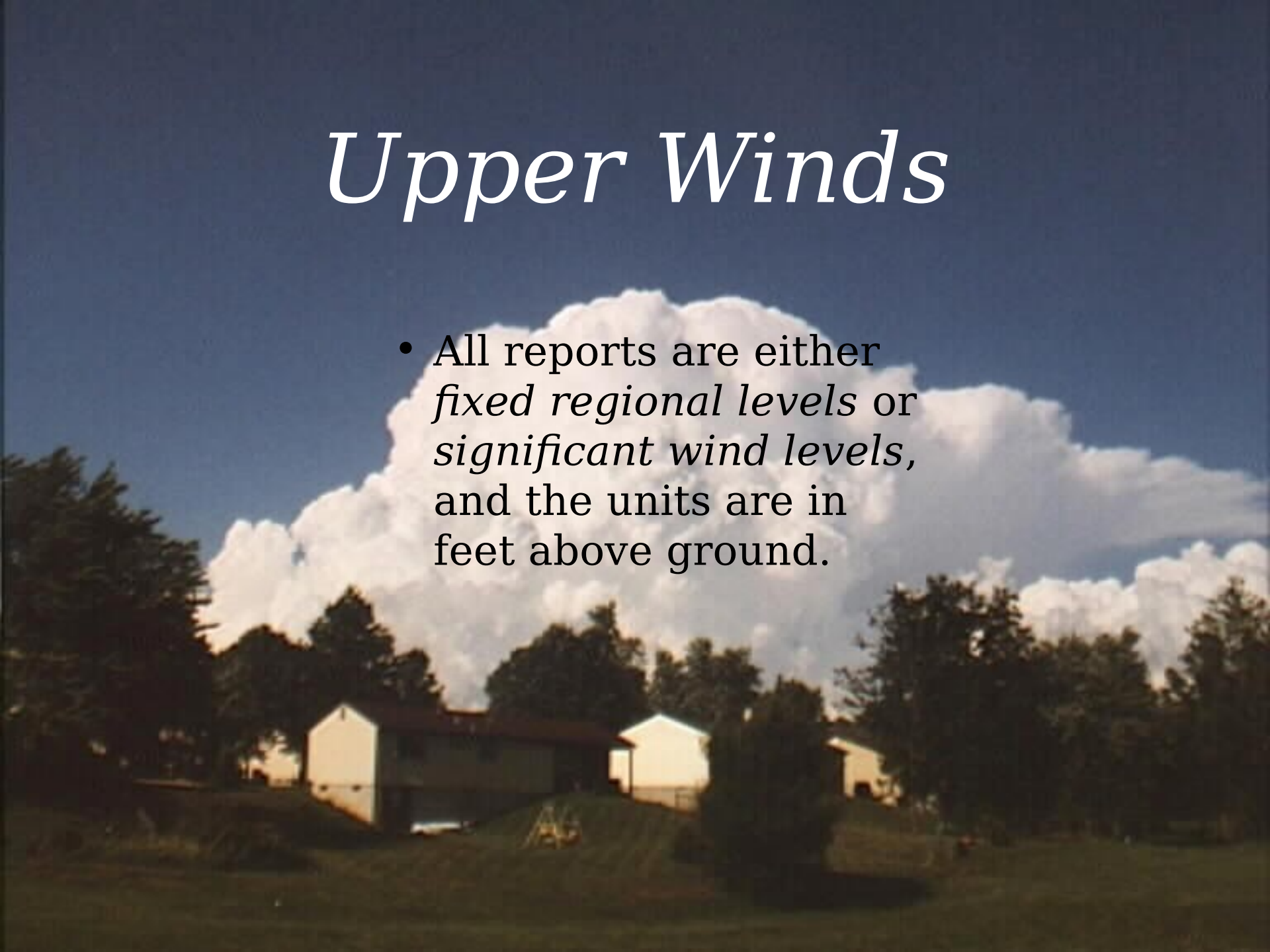
- Temperature and/or moisture profile indicating a substantial variation from the U. S. Standard Atmosphere (e.g. tropospheric lapse rate of 6.5 C/km).
- Lapse rate of temperature or dew point is changing significantly.
- Surface and the tropopause.
- All groups are coded similarly to the Mandatory Level group.

Significant Levels

- **TTBB** YYGG0 IIiii 00PPP TTTDD 11PPP TTTDD
22PPP TTTDD ... 99PPP TTTDD 11PPP TTTDD
22PPP TTTDD ... until done, then 31313 0hhmm
8hhmm
 - **00PPP**: Station Pressure.
 - **11PPP**: 1st Significant Level
 - **22PPP**: 2nd Significant Level.
 - **11PPP**: 10th Significant Level.
 - **31313**: Indicates supplemental data included.
 - **0hhmm**: Scheduled time of balloon release.
 - **8hhmm**: Actual time of balloon release.

Upper Winds

- All reports are either *fixed regional levels* or *significant wind levels*, and the units are in feet above ground.



Upper Winds

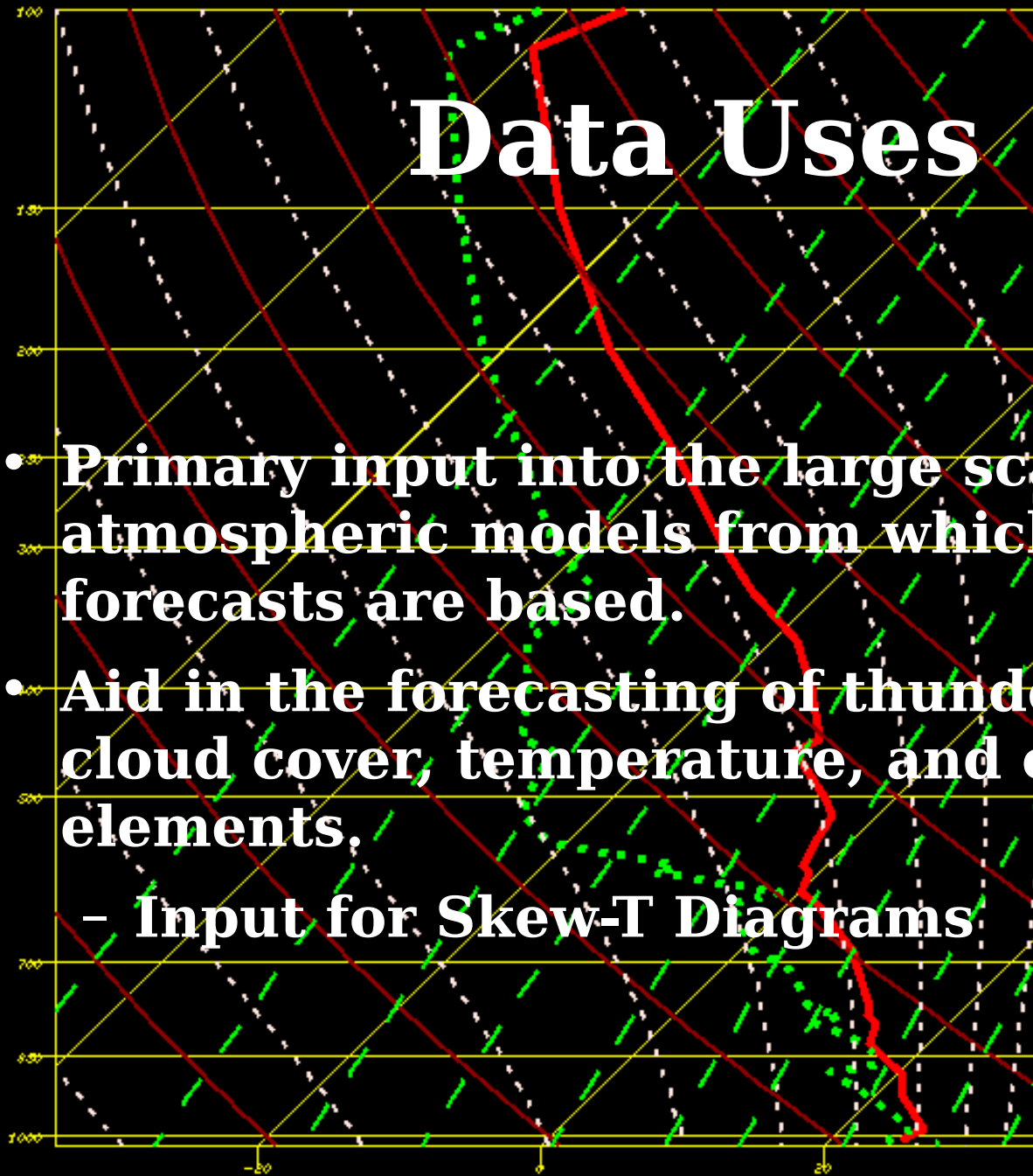
- **PPBB** YYGGa₄ Iiii 9tuuu dddff dddff dddff
9tuuu dddff dddff dddff 9tuuu dddff dddff
 - Reports winds up to 100 mb.
 - **9tuuu:**
 - t: Tens digit of following number groups (i.e. if t=1, then multiply heights by 1000).
 - uuu: Represents the height of the following number groups (i.e. if uuu=012, then the following groups represent the winds for 0, 1000 and 2000 feet.
 - **dddff:** Wind direction and speed.
 - If ddd ends in 1 or 6 then add 100 to ff.

The Iiii Structure

- **II:** block number is allocated to the services within each Region by regional agreement.
 - Region III: South America 80-88
 - Region IV: North and Central America70-79
- **iii:** Station numbers, corresponding to a common block number (II) except 89 are usually distributed so that the zone covered by a block number is divided into horizontal strips; e.g. one of several degrees of latitude. Where possible, station numbers within each strip increase from west to east and the first figure of the 3-figure station number increases from north to south.

Data Uses

- **Primary input into the large scale atmospheric models from which most forecasts are based.**
- **Aid in the forecasting of thunderstorms, cloud cover, temperature, and other elements.**
 - **Input for Skew-T Diagrams**



Where to Find Soundings

- Florida State University
 - www.met.fsu.edu/weather/
- 199th Weather Flight
 - www.dod.hawaii.gov/199wf/index.html#weather
- Research Applications Program
 - www.rap.ucar.edu/weather.html
 - Graphical Interface
- CMW
- NODDS

Questions?